CLAIMS

1. A device for detecting a road traveling lane, from images on a road surface continuously picked up by image pickup means, comprising:

edge point detection means for detecting a plurality of edge points in a contour on the image;

segment group producing means for providing a line segment for the plurality of edge points detected by said edge point detection means, on the basis of continuity of distance and direction between neighboring edge points, and grouping a plurality of line segments having a predetermined relationship with each other, to produce a segment group;

curve detection means for detecting a curve fitted to the segment group produced by said segment group producing means; and

lane boundary position defining means for comparing a plurality of curves distributed in the vicinity of right and left lane boundaries out of the curves detected by said curve detection means, with the segment groups produced by said segment group producing means, to define an innermost marking line, when a segment group forming a curve closest to the center of said traveling lane has a predetermined length and repeated cycle, and define a position of a neighboring curve outside of said innermost marking line relatively to the center of said traveling lane, as a position of a boundary of said traveling lane.

2. A device for detecting a road traveling lane as described in claim 1, wherein said segment group producing means produces said segment group for a group including a predetermined line segment and another line segment provided in an area of the predetermined distance and direction relative to the predetermined line segments in said plurality of line segment.

3. A device for detecting a road traveling lane as described in claim 1, wherein said segment group producing means provides said line segment for a group of edge points including the plurality of edge points detected by said edge point detection means, on the basis of continuity of distance and direction between neighboring edge points.

4. A device for detecting a road traveling lane as described in claim 1, wherein said segment group producing means determines that there is a predetermined relationship, to be processed as one group, when there is another line segment in an area of the predetermined distance and direction relative to a predetermined line segment, in a group of line segments based on said plurality of line segments.

5. A device for detecting a road traveling lane as described in claim 1, wherein said curve detection means applies a curve-fitting to the grouped line segments, to detect said curve.

6. A device for detecting a road traveling lane as described in claim 1, wherein said lane boundary position defining means determines if said line segments have a predetermined

length and cycle in a longitudinal direction or a lateral

direction to provide a block-like marking line, and removes

said block-like marking line from a lane boundary to be,

when said lane boundary position defining means determines

affirmatively, and wherein said lane boundary position

defining means determines that the curve provided outside of

said block-like marking line relatively to the center of

said traveling lane is said boundary of said traveling lane.

7. A device for detecting a road traveling lane as described

in claim 1, wherein said edge point detection means detects

the plurality of edge points on the image picked up by said

image pickup means, and makes a reverse projection of

coordinate data of the plurality of edge points on a 3-

dimensional road surface coordinate, to provide said

plurality of edge points.

8. A device for detecting a road traveling lane, from images

continuously picked up on the road by image pickup means,

comprising:

edge point detection means for detecting a plurality of edge

points from a contour on the images;

curve detection means for detecting curves fitted to the

plurality of edge points detected by said edge point

detection means;

segment group producing means for grouping groups of edge

points contributed to the curves detected by said curve

detection means, to produce segment groups; and

lane boundary position defining means for comparing a

plurality of curves distributed in the vicinity of right and left lane boundaries out of the curves detected by said curve detection means, with the segment groups produced by said segment group producing means, to define an innermost marking line, when a segment group produced for a curve closest to a center of said traveling lane indicates a predetermined length and repeated cycle, and define a position of a neighboring curve outside of said innermost marking line relatively to the center of said traveling lane, as a position of a boundary of said traveling lane.

9. A device for detecting a road traveling lane as described in claim 8, wherein said segment group producing means provides an edge histogram for the groups of edge points provided for the curves detected by said curve detection means, and groups the groups of edge points contributed to peaks of said histogram, to produce segment groups.

10. A device for detecting a road traveling lane as described in claim 9, wherein said lane boundary position defining means determines if the peaks of said histogram have a predetermined length and cycle in a longitudinal direction or a lateral direction to provide a block-like marking line, and removes said block-like marking line from a lane boundary to be, when said lane boundary position defining means determines affirmatively, and wherein said lane boundary position defining means determines that the curve provided outside of said block-like marking line relatively to the center of said traveling lane is said

boundary of said traveling lane.

11. A device for detecting a road traveling lane as described in claim 8, wherein said edge point detection means detects the plurality of edge points on the image picked up by said image pickup means, and makes a reverse projection of coordinate data of the plurality of edge points on a 3-dimensional road surface coordinate, to provide said plurality of edge points.